

REMARKS

The Office Action mailed on January 10, 2008, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 1-52 were pending. By this paper, Applicant adds claims 53-60. Therefore, claims 1-60 are now pending.

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Substance of Interview Summary

In view of the Interview held on March 18, 2008, Applicant submits that the Interview Summary (a copy of which is attached in Appendix A) provides a complete and proper recordation of the substance of the interview, per MPEP §713.04.

Applicant sincerely thanks Examiner Schell for extending the courtesy of the interview.

Rejections Under 35 U.S.C. § 102

Claims 1-25, 31-48, 51 and 52 are rejected under 35 U.S.C. § 102(e) as being anticipated by Yin (U.S. Patent No. 6,386,050). In response, Applicant traverses the rejection of all of these claims, and respectfully submits that the above claims are allowable for at least the reasons that follow.

Applicant relies on MPEP § 2131, entitled “Anticipation – Application of 35 U.S.C. 102(a), (b), and (e),” which states that a “claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” Section 103 amplifies the meaning of this anticipation standard by pointing out that anticipation requires that the claimed subject matter must be “*identically* disclosed or described” by the prior art reference. (Emphasis added.)

Independent claim 1 recites a system in which a light detector is positioned to receive a portion of a beam, wherein the detector measures a change in the *intensity of the beam caused by diffraction* of the beam by the heated portion of the fluid that passes through the beam.

As was detailed during the interview of March 18, 2008, Yin does not teach a change in the intensity of a beam caused by *diffraction*. Instead, Yin relies totally on *refraction* to bend his beam away from its original trajectory. As was detailed in the interview of March 18, 2008, diffraction is an entirely different physical phenomenon than refraction. This fact is evinced by the College Physics text entitled *Physics, Parts I and II, Combined Third Edition*, by David Halliday and Robert Resnick (see Appendix A), which clearly segregates the two phenomenon into entirely different chapters, as may be seen in the attached annotated table of contents. Accordingly, claim 1 cannot be anticipated by Yin, because Yin does not disclose/describe the identical subject matter of claim 1.

Claims 20 and 34 are not anticipated for reasons concomitant with the reason that claim 1 is not anticipated, as just detailed.

Claims 2-9, 21- 25, 31, 32, 34-40 and 48-50 variously depend from independent claims 1, 20 and 34, and thus are allowable for at least the reason that Yin anticipates none of these independent claims. That is, no claim that depends from any of claims 1, 20 and 34 can be anticipated by Yin.

* * * * *

Independent claims 10, 17 and 43 are also rejected as anticipated by Yin. As was detailed in the interview of March 18, 2008, claim 10 recites a system in which *a heat source heats a portion* of a fluid in a passageway. In an exemplary embodiment, as depicted in Fig. 4 of the application, the heat source is focused to only heat a portion of the fluid (see reference numbers 31/43) such that even after the heated *portion* of the fluid travels downstream and propagates away from the focus point 43, the heated portion is still just that, a heated *portion*, as may be seen in Fig. 4 in the area about point 44 in the fluid in between optical source 62 and detector 63. Specifically, the heated portion does not contact the walls

of the conduit 11 in the area between optical source 62 and detector 63. In contrast, Yin contains no teaching regarding heating a *portion* of a fluid, either “expressly or inherently.” As Yin fails to disclose/describe the identical subject matter of claim 10, Yin cannot anticipate claim 10 for at least this reason.

Claim 13, now in independent form, recites that “the fluid in the passageway has a non-uniform temperature profile.” Claim 17 recites that “a localized portion of the liquid in the passageway is heated.” Claim 43 recites “heating a portion of the liquid in the passageway.” These claims are not anticipated by Yin for the same reasons that render claim 10 unanticipated – Yin does not disclose/describe heating only a portion of the liquid in a passageway.

The claims that depend from claims 10, 13, 17 and 43 rejected as anticipated, variously claims 10-16, 18-24, 33, 41, 42, 44-47 and 51-52, are not anticipated by Yin for at least the reason that the respective independent claims are not anticipated by Yin. That is, no claim that depends from any of claims 10, 13, 17 and 43 can be anticipated.

Rejections Under 35 U.S.C. § 103

Claims 26-30, 49 and 50 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Frank (U.S. Patent No. 5,211,626) in view of Yin. In response, Applicant traverses this rejection for the following reasons.

As detailed above, Yin fails to teach each and every element of any independent claim. Yin also fails to suggest these elements. Frank does not remedy the above-identified deficiencies of Yin, and the Office Action does not assert the contrary. Accordingly, even after Yin and Frank are combined as proffered in the Office Action, no claim is rendered obvious because the third requirement of MPEP § 2143, that the prior art reference (or references when combined) must teach or suggest all the claim limitations, is not met.

New Claims

As seen above, Applicant has added new claims 53-60. Claim 53, for example, recites that the system is adapted to heat the portion of the fluid such that when the heated portion passes through the beam, the heated portion does not extend to any wall of the passageway. Claim 57, for example, recites that the system is adapted to heat the heated portion of the fluid such that when a centroid of diffraction of the heated portion passes through the beam, a first temperature of the fluid at any first location on a surface of any wall of the passageway on a plane on which the beam is located is the same as a second temperature of the fluid as measured at the same first location prior to the centroid of diffraction passing through the beam. The other new claims variously parallel these claims.

These claims further recite differences between the present inventions and Yin and/or the combination of Yin with Frank, and thus are allowable beyond the mere fact that they all depend from independent claims that are allowable as detailed above. Entry and allowance is requested.

Conclusion

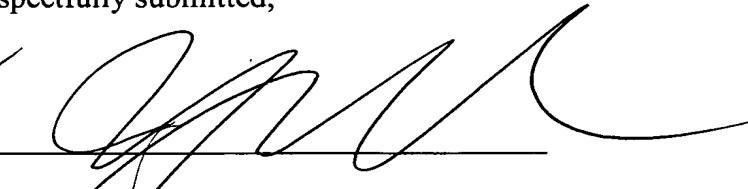
Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Schell is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date April 10, 2002

By 

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 295-4747
Facsimile: (202) 672-5399

Martin J. Cosenza
Attorney for Applicant
Registration No. 48,892

APPENDIX A



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,562	02/26/2004	Burton H. Sage JR.	080219-0106	1798

22428 7590 03/26/2008
FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

SHELL, LAURA C

ART UNIT	PAPER NUMBER
----------	--------------

3767

MAIL DATE	DELIVERY MODE
-----------	---------------

03/26/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Interview Summary	Application No.	Applicant(s)	
	10/786,562	SAGE, BURTON H.	
	Examiner	Art Unit	
	LAURA C. SCHELL	3767	

All participants (applicant, applicant's representative, PTO personnel):

(1) LAURA C. SCHELL. (3)_____

(2) Martin Cosenza. (4)_____

Date of Interview: 18 March 2008.

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
If Yes, brief description: _____

Claim(s) discussed: 1, 20 and 34.

Identification of prior art discussed: Yin et al. (US Patent No. 6,386,050).

Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: See Continuation Sheet.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Laura C Schell/
Examiner, Art Unit 3767

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiner's Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Mr. Cosenza discussed with the examiner the differences between diffraction and refraction in order to help explain the differences between Applicant's invention and the Yin reference, the main difference being that Yin teaches refraction as seen in Fig. 4 and Applicant's invention teaches diffraction. Mr. Cosenza also pointed out that the Yin reference involves heating the entire portion of fluid at the point of the heater, while Applicant's reference teaches heating only a localized portion of fluid as seen in Fig. 2. The examiner explained to Mr. Cosenza that she will wait for the formal filing of Applicant's arguments and consider them at that time.

APPENDIX B

PHYSICS

PARTS
1&2

physics

*PARTS I and II, COMBINED
THIRD EDITION*

*PROFESSOR OF PHYSICS
UNIVERSITY OF PITTSBURGH*

DAVID HALLIDAY

*PROFESSOR OF PHYSICS
RENSSELAER POLYTECHNIC INSTITUTE*

ROBERT RESNICK

JOHN WILEY & SONS

NEW YORK CHICHESTER BRISBANE TORONTO SINGAPORE

contents

1-1 Physical Quantities, Standards, and Units 3	1
1-2 The International System of Units 4	MEASUREMENT
1-3 The Standard of Length 6	3
1-4 The Standard of Mass 8	
1-5 The Standard of Time 9	
2-1 Vectors and Scalars 15	2
2-2 Addition of Vectors, Geometrical Method 16	VECTORS
2-3 Resolution and Addition of Vectors, Analytic Method 17	15
2-4 Multiplication of Vectors 21	
2-5 Vectors and the Laws of Physics 24	
3-1 Mechanics 30	3
3-2 Particle Kinematics 30	MOTION IN ONE
3-3 Average Velocity 31	DIMENSION
3-4 Instantaneous Velocity 32	30
3-5 One-Dimensional Motion—Variable Velocity 33	
3-6 Acceleration 35	
3-7 One-Dimensional Motion—Variable Acceleration 37	
3-8 One-Dimensional Motion—Constant Acceleration 38	
3-9 Consistency of Units and Dimensions 40	
3-10 Freely Falling Bodies 43	
3-11 Equations of Motion in Free Fall 44	
4-1 Displacement, Velocity, and Acceleration 53	4
4-2 Motion in a Plane with Constant Acceleration 54	MOTION IN A PLAN
4-3 Projectile Motion 55	53
4-4 Uniform Circular Motion 59	
4-5 Tangential Acceleration in Circular Motion 63	
4-6 Relative Velocity and Acceleration 64	

- 40-1 The Basic Equations of Electromagnetism 880
- 40-2 Induced Magnetic Fields 882
- 40-3 Displacement Current 884
- 40-4 Maxwell's Equations 885
- 40-5 Maxwell's Equations and Cavity Oscillations 886

40 *MAXWELL'S EQUATIONS* 880

- 41-1 Introduction 893
- 41-2 The Electromagnetic Spectrum 893
- 41-3 Electromagnetic Waves From Space 896
- 41-4 Transmission Lines 897
- 41-5 Coaxial Cable—Fields and Currents 899
- 41-6 Waveguide 902
- 41-7 Radiation 904
- 41-8 Traveling Waves and Maxwell's Equations 905
- 41-9 The Poynting Vector 909

41 *ELECTROMAGNETIC WAVES* 893

- 42-1 Introduction 918
- 42-2 Energy and Momentum 919
- 42-3 The Speed of Light 922
- 42-4 Moving Sources and Observers 927
- 42-5 Doppler Effect 929

42 *THE NATURE AND PROPAGATION OF LIGHT* 918

- 43-1 Reflection and Refraction 938
- 43-2 Huygens' Principle 943
- 43-3 Huygens' Principle and the Law of Reflection 944
- 43-4 Huygens' Principle and the Law of Refraction 944
- 43-5 Total Internal Reflection 947
- 43-6 Fermat's Principle 949

43 *REFLECTION AND REFRACTION—PLANE WAVES AND PLANE SURFACES* 938

- 44-1 Geometrical Optics and Wave Optics 957
- 44-2 Spherical Waves—Plane Mirror 959
- 44-3 Spherical Waves—Spherical Mirror 963
- 44-4 Spherical Refracting Surface 969
- 44-5 Thin Lenses 973
- 44-6 Optical Instruments 980

44 *REFLECTION AND REFRACTION—SPHERICAL WAVES AND SPHERICAL SURFACES* 957

- 45-1 Young's Experiment 994
- 45-2 Coherence 998
- 45-3 Intensity in Young's Experiment 1002
- 45-4 Adding Wave Disturbances 1004
- 45-5 Interference in Thin Films 1006
- 45-6 Optical Reversibility and Phase Changes on Reflection 1010
- 45-7 Michelson's Interferometer 1011
- 45-8 Michelson's Interferometer and Light Propagation 1013

45 *INTERFERENCE* 994

- 46-1 Introduction 1023
- 46-2 Single Slit 1025
- 46-3 Single Slit—Qualitative 1028
- 46-4 Single Slit—Quantitative 1030
- 46-5 Diffraction at a Single Aperture 1034
- 46-6 Double Slit Interference and Diffraction Combined 1037

46 *DIFFRACTION* 1023

- 47-1 Introduction 1047
- 47-2 Multiple Slits 1047
- 47-3 Diffraction Gratings 1051

47 *GRATINGS AND SPECTRA* 1047

